REMARKS

Claim Amendments

Amended claim 1 now includes the limitations of previous claim 3 and the temperature range of previous claim 8. Claims 3 and 8 have been canceled.

Amended claim 11 now includes the limitations of previous claim 3 and the temperature range of previous claim 8.

Amended claim 18 now includes the limitations of previous claim 3 and the temperature range of previous claim 8.

35 U.S.C. 103(a) Rejections

Claims 1, 3, 5-11, 13-18 and 20-23 were rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 5,556,447 to Srinivasachar *et al.*, U.S. Patent No. 5,245,120 to Srinivasachar *et al.*, U.S. Patent No. 5,803,663 to Matsuyama *et al.*, U.S. Patent No. 6,399,851 to Siddle, U.S. Patent No. 6,416,567 to Edlund *et al.*, "Regeneration of activated carbon used in the adsorption of mercury and organomercury compounds in waste gases" to Zemskov *et al.*, EP 380467 to Fercher *et al.*, JP 04-061981 to Fujita, JP 07-155722 to Hamaguchi *et al.*, JP 07-155723 to Hamaguchi *et al.*, DE 19801321 to Hoermeyer *et al.*, JP 2003-154233 to Okada, and Research Disclosure 470003 "Treatment of mercury in fly ash by the CBO process" to Cochran *et al.*, alone or in view of U.S. Patent No. 5,280,701 to Tolman, and line 6, page 8 of Applicants' specification. In view of the amendment above and the remarks below, reconsideration is respectfully requested.

In amended independent claims 1, 11 and 18, the claimed methods include the step of depositing the material being treated (e.g., activated carbon) on an air slide floor

having openings and passing heated flowing air through the openings to move the amount of sorbent from a beginning to an exit area of the air slide. The material is removed from the air slide when the measured in process temperature reaches a temperature in the range of 700°F to 1000°F. The claimed method is advantageous in that the material being treated is conveyed and treated at the same time. The claimed method is also advantageous in that the mercury is removed from fly ash or activated carbon without combusting the carbon. The combustion of carbon is limited by removing the material when the temperature range of 700°F to 1000°F is reached as now recited in claims 1, 11 and 18. Limiting the combustion of carbon is critical in that the activated carbon may be reused (see claim 16).

An air slide is one way to move particulate materials such as fly ash and activated carbon. However, conventional air slides operate at ambient or the handled material's temperature without heat input. In the present invention, the air slide has been improved to accept heated flowing air through openings in the air slide floor to move the amount of sorbent from a beginning to an exit area of the air slide, wherein the flowing air is passed through the openings until the particulate matter reaches a temperature of 700°F to 1000°F is reached. The particulate matter is then removed from the air slide to limit carbon combustion and also allow for reuse of activated carbon sorbent.

It is well settled that "when patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness." *In re Lee*, 277 F.3d 1338, 1343 (Fed.

Cir. 2002). Furthermore, "particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed" *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000).

Turning now to the references, U.S. Patent No. 5,556,447 to Srinivasachar et al. describes processes for treating wastes contaminated by toxic metals. Among other things, this patent describes heating mercury-laden carbon in a small purge air flow (column 10, lines 22-26). However, this patent does not teach or suggest using an air slide for the heating, or removing the material from the air slide when the material reaches a temperature of 700°F to 1000°F as recited in amended independent claims 1, 11 and 18. At noted in the Office Action, U.S. Patent No. 5,556,447 does mention an "other combustion chamber". However, this language does not provide the requisite motivation for one to use an air slide in the temperature ranges (which are not intended for combustion) of amended claims 1, 11 and 18.

Likewise, U.S. Patent No. 5,245,120 to Srinivasachar et al. describes processes for treating wastes contaminated by toxic metals. However, this patent does not teach or suggest or motivate one to use an air slide for the heating, or to remove the material from the air slide when the material reaches a temperature of 700°F to 1000°F as recited in amended independent claims 1, 11 and 18.

U.S. Patent No. 5,803,663 to Matsuyama et al. describes processes for treating soils contaminated by mercury. Heating is accomplished in a crucible in a heat reaction vessel (column 4, lines 44-46). However, this patent does not teach or suggest using an air slide for the heating, or removing the material from the air slide when the material

reaches a temperature of 700ºF to 1000ºF as recited in amended independent claims 1, 11 and 18. At noted in the Office Action, U.S. Patent No. 5,803,663 does mention an "other furnace". However, this language does not provide the requisite motivation for one to use an air slide in the temperature ranges (which are not intended for combustion) of amended claims 1, 11 and 18.

U.S. Patent No. 6,399,851 to Siddle describes the treatment of contaminated substrate materials such as soil, sludge, sediments, drilling muds and cuttings with heat. The heating is carried out indirectly in an extraction chamber with externally applied heat (column 3, lines 57-60). However, this patent does not teach or suggest or motivate one to use an air slide for the heating, or to remove the material from the air slide when the material reaches a temperature of 700ºF to 1000ºF as recited in amended independent claims 1, 11 and 18. Note the 1100°F temperature of the soil in Fig. 5 of Siddle.

U.S. Patent No. 6,416,567 to Edlund et al. describes processes for treating wastes contaminated by mercury. Heating is accomplished in an oven with a screw auger (column 3, lines 47-56). Thus, this patent does not teach or suggest or motivate one to use an air slide for the heating as recited in amended independent claims 1, 11 and 18.

The abstract for the article entitled "Regeneration of activated carbon used in the adsorption of mercury and organomercury compounds in waste gases" by Zemskov et al. describes a process for treating activated carbon contaminated by mercury. This abstract describes heating mercury-laden carbon in a nitrogen flow. However, this

patent does not teach or suggest or motivate one to use an air slide for the heating as recited in amended independent claims 1, 11 and 18.

The abstract for EP 380467 to Fercher et al. describes a process for treating dust residues contaminated by, among other things, mercury. This abstract does not teach or suggest or motivate one to use an air slide for the heating as recited in amended independent claims 1, 11 and 18.

The abstract for JP 04-061981 to Fujita describes a process for treating incinerator ash and addresses several metals including mercury. Animal bone powder and clay is used for making an adsorbent and calcined at 1000°C. Heating is accomplished in a rotating kiln operating within a range of 1000°C to 1500°C. This abstract does not teach or suggest or motivate one to use an air slide for the heating, or to remove the material from the air slide when the material reaches a temperature of 700ºF to 1000ºF as recited in amended independent claims 1, 11 and 18. Note the 1000°C to 1500°C temperatures of Fujita.

The abstract for JP 07-155722 to Hamaguchi et al. describes a process for treating incinerator ash for dioxin and mercury. Heating is accomplished in an oven with a screw auger 8. This abstract does not teach or suggest or motivate one to use an air slide for the heating, or to remove the material from the air slide when the material reaches a temperature of 700ºF to 1000ºF as recited in amended independent claims 1, 11 and 18. Dioxins are believed to thermally decompose at 700°C which is above the 1000°F temperature of amended claims 1, 11 and 18.

The abstract for JP 07-155723 to Hamaguchi et al. describes a process for treating incinerator ash for dioxin and mercury. Heating is accomplished in an oven with

a screw auger 8. This abstract does not teach or suggest or motivate one to use an air slide for the heating, or to remove the material from the air slide when the material reaches a temperature of 700°F to 1000°F as recited in amended independent claims 1, 11 and 18. Dioxins are believed to thermally decompose at 700°C which is above the 1000°F temperature of amended claims 1, 11 and 18.

The abstract for DE 19801321 to Hoermeyer et al. describes the treatment of mercury contaminated soils. This abstract does not teach or suggest or motivate one to use an air slide for the heating, or to remove the material from the air slide when the material reaches a temperature of 700°F to 1000°F as recited in amended independent claims 1, 11 and 18.

The abstract for JP 2003-154233 to Okada describes a process for treating activated carbon contaminated by mercury. This abstract does not teach or suggest or motivate one to use an air slide for the heating, or to remove the material from the air slide when the material reaches a temperature of 700°F to 1000°F as recited in amended independent claims 1, 11 and 18. Dioxins are believed to thermally decompose at 700°C which is above the 1000°F temperature of amended claims 1, 11 and 18.

The Research Disclosure 470003 entitled "Treatment of mercury in fly ash by the CBO process" by Cochran et al. describes a process using a large fluidized bed furnace. This abstract does not teach or suggest or motivate one to remove the material from the air slide when the material reaches a temperature of 700°F to 1000°F as recited in amended independent claims 1, 11 and 18. Note the 1350°F exit temperature of Cochran, which is well above the 1000°F temperature of amended

claims 1, 11 and 18. Note also that Cochran combusts the carbon (which the present invention avoids to allow reuse of the carbon).

U.S. Patent No. 5,280,701 to Tolman is cited as describing the use of a "fluidized bed combustor". However, the point of Tolman is to combust vapors (see column 8, lines 1-2 of Tolman). Thus, Tolman does not teach or suggest or motivate one to remove material from an air slide when the material reaches a temperature of 700°F to 1000°F as recited in amended independent claims 1, 11 and 18. The present invention seeks to avoid combustion of the carbon so that it can be reused.

U.S. Patent No. 3,664,935 to Johnson has been cited to show an air slide. However, Johnson does not teach or suggest or motivate one to use an air slide at a temperature of 700°F to 1000°F as in amended independent claims 1, 11 and 18.

U.S. Patent No. 4,619,531 to Dunstan has been cited to show an air slide. However, Dunstan does not teach or suggest or motivate one to use an air slide at a temperature of 700°F to 1000°F as in amended independent claims 1, 11 and 18.

The abstract of Stegmaier has been cited to show an air slide. However, Stegmaier does not teach or suggest or motivate one to use an air slide at a temperature of 700°F to 1000°F as in amended independent claims 1, 11 and 18.

U.S. Patent No. 3,284,317 to Jahnig et al. has been cited to show an air slide. However, note the temperatures of 2000°F to 3000°F at column 2, lines 42-44 in Jahnig. Thus, Jahnig does not teach or suggest or motivate one to use an air slide at a temperature of 700°F to 1000°F as in amended independent claims 1, 11 and 18.

Therefore, it is respectfully submitted that the cited references do not provide the requisite motivation for one to use an air slide in the temperature ranges (which are not

intended for combustion) of amended claims 1, 11 and 18.. Accordingly, it is believed that independent claims 1, 11 and 18 (and the remaining claims that depend thereon) are patentable over the cited references.

Conclusion

It is believed that the entire application is in condition for allowance. If any fees are needed, please charge them to deposit account 17-0055.

Respectfully submitted,

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